

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in and relating to Anti-Vibration Mounting Elements

We, GEORGE ANGUS & COMPANY LIMITED of Angus House, 152—158 Westgate Road, Newcastle upon Tyne 1, a British Company, do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to anti-vibration mountings for supporting machines or other apparatus and particularly, but not exclusively, engine or other chassis-mountings on motor vehicles.

According to the invention, an anti-vibration mounting element consists of a cushion, of resilient micro-cellular polyurethane material, basically cylindrical in shape and of circular cross-sectional outline with variation in diameter along the cylindrical axis, the cushion having a uniform central axial bore or a central axial recess in one or both ends and, nearer one end than the other, an outer circumferential mounting groove which is deeper than any other circumferential groove which the cushion might have and is designed to enable the cushion to be mounted in a hole through a supporting or supported member, the two end portions of the cushion, extending respectively from the mounting groove, having relatively different axial load/deflection characteristics.

Locating the mounting groove nearer one end of the cushion than the other provides a simple way of obtaining different axial load/deflection characteristics for the end portions of a cushion of a material with a uniform characteristic, the characteristics of each end portion depending upon its size and shape.

The cushion provided by the invention can be regarded as, and in use is equivalent to, two cushions joined base-to-base by a neck formed by the mounting groove.

The mounting groove enables the cushion to be simply mounted in a hole through a supporting or supported member, such as a

mounting plate or bracket, the width and depth of the hole fitting the corresponding dimensions of the groove so that the cushion can, through resilient deformation, be pressed into engagement of its groove as a snap fit with the border of the hole. In other words, the cushion can be fitted into a hole like a rubber grommet.

Consequently, the usual comparatively elaborate bonded rubber and metal fittings of known anti-vibration mountings are avoided, even for large or heavy-duty mountings for which the micro-cellular polyurethane has sufficient capability of compression and resilient recovery to be engaged in and grip the border of a mounting hole.

The two ends of the cushion, at either side of the mounting groove, can be designed for different load/deflection characteristics, to suit initial shock and rebound respectively, and this is of particular advantage in use on motor vehicles.

Different load/deflection characteristics for the two ends of the cushion could be achieved by modification of the resilient properties of the material forming the respective end portions, such as by making them of different density or cellular structure.

The cushion has a uniform central bore which permits inward deflection of the material under load and may also be required for fitting of the cushion as a sleeve in some uses. Alternatively a central axial recess in one or both ends could serve similar purposes to those of a central bore.

Examples of anti-vibration mounting cushions in accordance with the invention are illustrated by way of example on the drawing accompanying the Provisional Specification, in which:—

Figs. 1 to 4 are side elevations of four shapes of cushion respectively and

Figs. 5 to 8 are corresponding plan views thereof.

Each cushion shown consists of a cylindrical body 1 with a uniform bore 2 along the longitudinal axis and an outer circumferential mounting groove 3 for resilient, snap-in engagement with the margin of a hole in a mounting member 4.

Due to the offsetting of the groove 3 as shown, the end portions of the cushion are of different size and have different load/deflection characteristics. Fig. 1 is an example of this for a cushion of basically simple cylindrical shape.

Figs. 2 and 4 show how the diameter of the body 1 can be reduced towards its ends, by arcuate or rectilinear tapering respectively, and Fig. 3 shows how the body 1 can be corrugated so that it has other circumferential grooves 5 which are shallower than the groove 3, to vary the cross-sectional area of the cushion along its loaded axis to suit load/deflection requirements.

The cushions illustrated are preferably moulded or cast from micro-cellular polyurethane.

WHAT WE CLAIM IS:—

1. An anti-vibration mounting element consisting of a cushion, of resilient micro-cellular

polyurethane material, basically cylindrical in shape and of circular cross-sectional outline with variation in diameter along the cylindrical axis, the cushion having a uniform central axial bore or a central axial recess in one or both ends and, nearer one end than the other, an outer circumferential mounting groove which is deeper than any other circumferential groove which the cushion might have and is designed to enable the cushion to be mounted in a hole through a supporting or supported member, the two end portions of the cushion, extending respectively from the mounting groove, having relatively different axial load/deflection characteristics.

2. An anti-vibration mounting element consisting of a cushion substantially as described and as shown by Figs. 1 and 5, Figs. 2 and 6, Figs. 3 and 7 or Figs. 4 and 8 of the drawing accompanying the Provisional Specification.

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FIG. 1

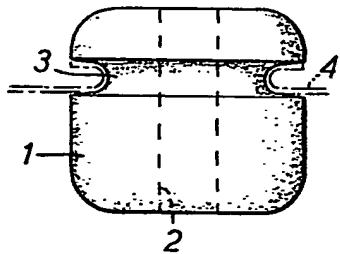


FIG. 2

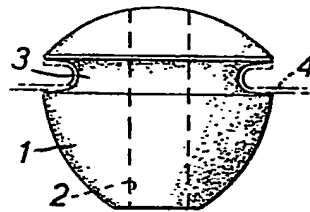


FIG. 3

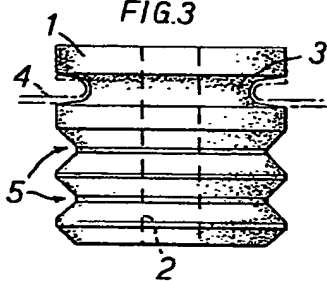


FIG. 4

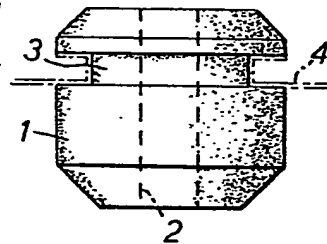


FIG. 5

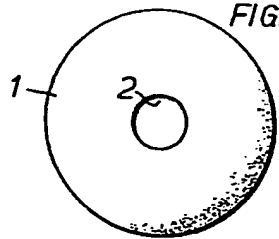


FIG. 6

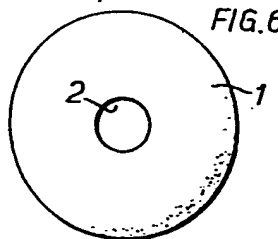


FIG. 7

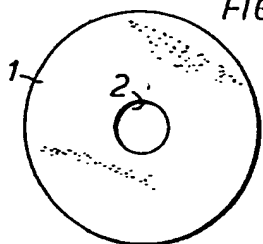


FIG. 8

